Fact Sheet for NPDES Permit No. WA0001791

Shell Oil Products, US – Seattle Distribution Terminal

June 8, 2016

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for Shell Oil Products, US – Seattle Distribution Terminal (Shell).

This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for Shell, NPDES permit WA0001791, are available for public review and comment from January 19, 2016, until February 18, 2016. For more details on preparing and filing comments about these documents, please see *Appendix A – Public Involvement Information.*

Shell reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, discharges, or receiving water prior to publishing this draft fact sheet for public notice.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as *Appendix F – Response to Comments*, and publish it when issuing the final NPDES permit. Ecology generally will not revise the rest of the fact sheet. The full document will become part of the legal history contained in the facility's permit file.

Summary

Shell operates a bulk petroleum distribution terminal and tank farm that discharges to the Duwamish River West Waterway. Ecology issued the previous permit for this facility on February 16, 2010.

The Duwamish River and Waterway are included on the state of Washington's 303(d) list of impaired waters for water quality exceedences of dissolved oxygen, fecal coliform, and ammonia in the water column, and numerous water quality exceedences in the sediment column such as cadmium, mercury, and sediment bioassay.

The discharge consists of 90% stormwater and 10% process water (stormwater getting into the loading rack area, intermittent spillage in the loading rack, rail car drip pans, intermittent water drawn from product tanks, water used to test pipelines and hoses (hydrotest water), etc. Process water is treated through an oil water separator (OWS), followed by a granulated activated carbon system, prior to discharge to the main OWS which is coupled with zinc treatment system. Stormwater is treated through the main OWS and a zinc treatment system.

Effluent limits for oil & grease, TSS, zinc and pH are unchanged from the permit issued in 2010. Benchmark values for copper, lead, and turbidity have been added to the permit Outfall 001. Benchmark values for copper, zinc, and turbidity have been added to the permit Outfall 002. These values are consistent with the Industrial Stormwater General Permit.

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I. Introduction

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the State of Washington to manage the NPDES permit program in our State. Our State Legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to industrial NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC).
- Water quality criteria for surface waters (chapter 173-201A WAC).
- Water quality criteria for ground waters (chapter 173-200 WAC).
- Whole effluent toxicity testing and limits (chapter 173-205 WAC).
- Sediment management standards (chapter 173-204 WAC).
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC).

These rules require any industrial facility owner/operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See *Appendix A – Public Involvement Information* for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in *Appendix F*.

II. Background information

Table 1. General Facility Information

Facility Information	
Applicant	Shell Oil Products, US
Facility Name and Address	Seattle Distribution Terminal 2555 13th Avenue Southwest Seattle, WA 98134
Contact at Facility	Name: Paul Katz Telephone #: 206-224-0484
Responsible Official	Ernest Haynes Title: Facilities Manager
Industry Type	Bulk Petroleum Storage & Distribution
Type of Treatment	Oil water separator, metalRx filtration cartridges, and carbon treatment system
SIC Codes	5171 Petroleum bulk terminal
NAIC Codes	424710 Petroleum bulk terminal
Facility Location (NAD83/WGS84 reference datum)	Latitude: 47.48196ºN Longitude: -122.352232ºW
Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)	Duwamish River West Waterway Outfall 001 Latitude: 47.58ºN Longitude: -122.351111ºW Outfall 002 Latitude: 47.581111ºN Longitude: -122.353611ºW

Permit Status	
Renewal Date of Previous Permit	February 16, 2010
Application for Permit Renewal Submittal Date	August 12, 2014
Date of Ecology Acceptance of Application	February 4, 2015

Inspection Status	
Date of Last Non-sampling Inspection Date	November 2, 2011

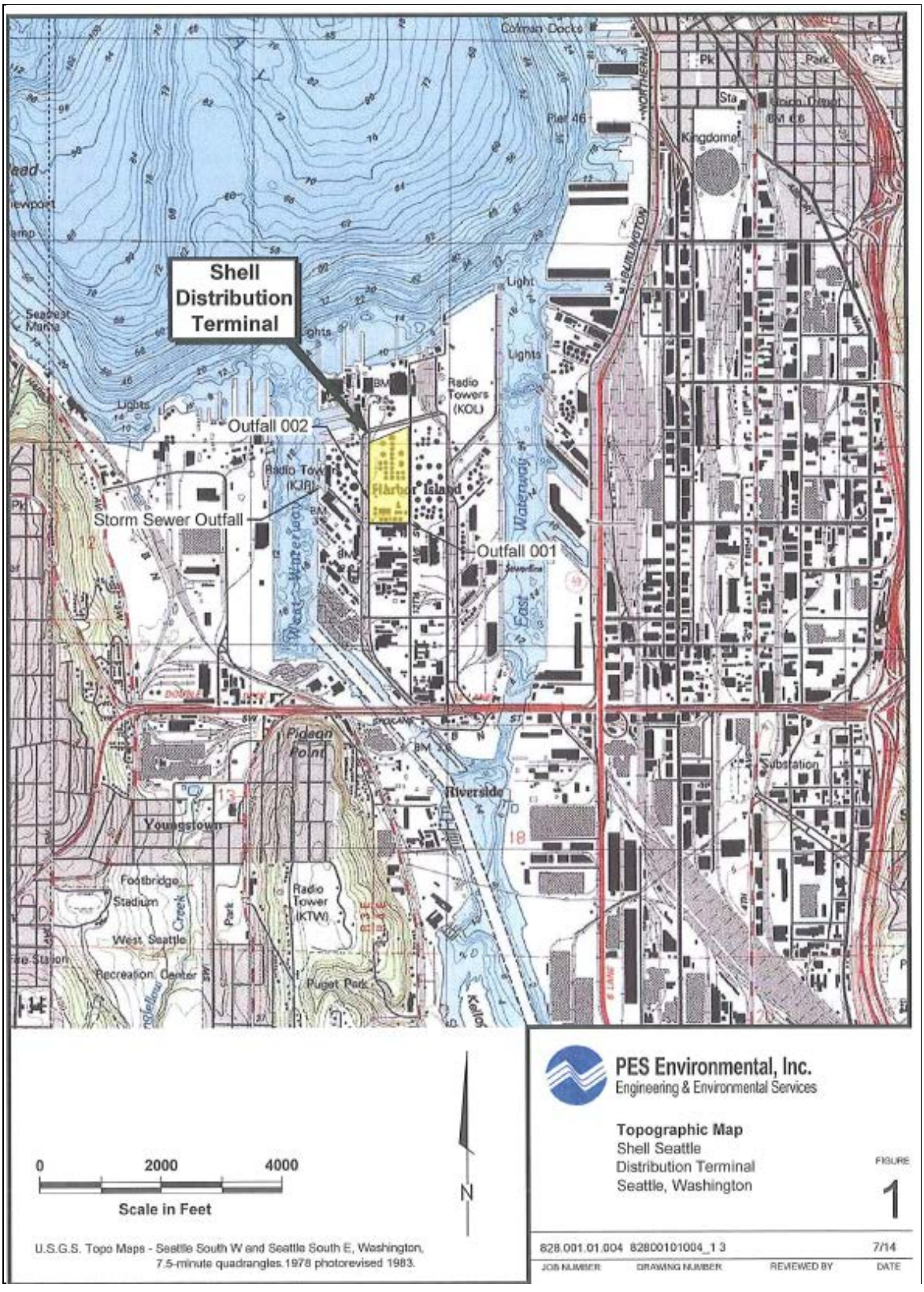

Figure 1. Facility Location Map

A. Facility description

Site description

The Shell Seattle Distribution Terminal was constructed in 1947 and comprises 19 acres of land on the north central part of Harbor Island near the mouth of the Duwamish River (see Figure 1). Soil and groundwater at various areas within the facility were contaminated with petroleum hydrocarbons. Surface soil was contaminated with lead and arsenic from an off-site smelter operation. Cleanup of lead and arsenic has been completed. Cleanup of petroleum contamination is ongoing. Harbor Island itself is a Superfund Site and is on the Environmental Protection Agency's National Priorities List.

The facility is divided into three parcels—the main terminal and tank farm (2555 – 13th Avenue SW), the north tank farm (1300 SW Florida Street), and the shoreline manifold area and dock (1711 – 13th Avenue SW). Elliott Bay is adjacent to the north edge of the shoreline manifold area. The facility receives, stores, and distributes bulk fuel oils, including gasoline, diesel, biodiesel, aviation gasoline, jet fuel, and ethanol.

North tank farm

The north tank farm comprises approximately 1.4 acres northwest of the intersection of 13th Avenue SW and SW Florida Street. The tank farm contains two 1.5 million gallon capacity aboveground storage tanks located within an unpaved area enclosed by a concrete containment wall. Both tanks are currently out of service, and each tank has been cleaned and disconnected from the Olympic Pipeline that previously supplied product to the tanks. No process wastewater is generated from this portion of the facility. Shell also owns an additional 1 acre of land immediately east of the north tank farm; this parcel is currently leased to the Port of Seattle for vehicle parking.

Shoreline manifold and dock

The shoreline manifold area and dock are located on the north side of the intersection of 13th Avenue SW and SW Massachusetts Street. The dock is also known as Pier 15, which extends 590 feet into Elliott Bay. Shell operates on the eastern portion of the dock, and Rainier Petroleum (Rainier) operates on the western portion of the dock. Shell indicates that no industrial activity is conducted on the northern 170 feet of Shell's side of the dock. Stormwater which falls on this portion of the dock drains directly to Elliott Bay through holes in the dock surface.

The 75-foot long middle-northern portion of the dock includes the only portion of Shell's side of the dock with industrial activity. Shell periodically unloads petroleum product from barges in this area, transferring the product to pipelines running to the shoreline manifold area. All activities in this area are within containment, and stormwater drainage from this area is collected and transferred by means of piping to Rainier's collection sump located on the west side of the dock for handling. Rainier pretreats the water prior to discharge to the sanitary sewer through its discharge permit (Discharge Authorization No. 536-04) with King County's Industrial Wastewater Division. All eleven pipelines exiting this area toward the shore are un-flanged (welded and without connection fittings) between this area and the shoreline manifold area; five of the pipelines are used to transfer product to the main tank farm, and six have been cleaned and taken out of service.

The 80-foot long middle-southern area of Shell's side of the dock is a former barge unloading area that is permanently out of service. Un-flanged product pipelines cross this area, but no industrial activities take place. Stormwater which falls in this area is also collected in the containment area and drained to Rainier's sump tank for treatment prior to discharge to sanitary sewer.

The southern 265 feet of Shell's side of the dock consists of un-flanged pipelines positioned on cast iron grates; no industrial activity takes place in this area. No stormwater is collected on Shell's side of the dock in this area since rain passes through the grates directly into Elliott Bay. The dock lies 250 feet to the west of the shoreline manifold area. Shell's eleven aboveground pipelines between the dock and the shoreline manifold area cross an unpaved portion of the property owned by Rainier Petroleum.

The 0.2-acre shoreline manifold area contains aboveground pipelines from the dock, manifolds controlling the flow of product between the dock and the main tank farm, a concrete containment pad beneath the manifold, a 2,000-gallon tank within a concrete containment area, and belowground pipelines to the main tank farm. A bulkhead on the north side of the shoreline manifold area separates the manifold area from Elliott Bay to the north. Almost of all of the shoreline manifold area is unpaved, covered with gravel, and all precipitation falling in this area infiltrates the unpaved surface. Stormwater collected in the two containment areas in the shoreline manifold area is inspected for evidence of product prior to opening the valve to drain it to the unpaved ground surface. If an oily sheen is observed, Shell's operational procedure is to contract a vacuum truck to come in to remove and dispose of the water.

Shell has developed and submitted the Dock Operations Manual (DOM) and Prevention Plan to Ecology's Spills Prevention Unit in the Spills Program. This unit inspects, reviews, and approves the facility's DOM and Prevention Plan. Both documents pertain to spills prevention.

Main terminal and tank farm

The main terminal and tank farm are located on 17.4 acres lying west of 13th Avenue SW, south of SW Florida Street, east of 16th Avenue SW, and north of SW Lander Street. The main facility consists of three office buildings, a light oil truck loading rack, a truck pump off pad, pipeline receipt facilities, a rail receipt facility located west of the main tank farm, one regulated underground tank, four unregulated underground tanks, 24 aboveground product storage tanks (four of which have been cleaned and are out of service), a pump house and manifold pit located south of the main tank farm, a vapor recovery system, piping and pumps, drum storage areas, one product quality test room, and a garage (see Figure 2).

The main terminal receives primarily light oils (fuels) by means of the Olympic Pipe Line from Northwest Washington refineries, ethanol and aviation gasoline via rail, and neat biodiesel and ethanol via truck. Lube operations, including storage and distribution, ceased in December 2003, and the lubricants infrastructure (including all lubricant tanks in the southern part of the terminal, the lubricants railcar unloading area, the southern truck loading rack, associated piping system, the western manifold pit, the two warehouses, the blending building, the boiler, and the boiler UST) were removed or closed in place in late 2012.

Truck-loading racks

The main terminal currently contains one truck-loading rack for the light fuel oils. The light oil loading rack is located south of the terminal garage, and it was constructed in 1981. The rack is constructed with a canopy, a concrete pad, dedicated product-loading arms, and underground pipelines delivering fuel to the rack. The light oil loading rack consists of six truck-loading lanes, where lane 6 is dedicated for biofuel operations.

The light oil truck-loading rack is equipped with a vapor recovery system, a concrete pad, concrete curbs, and a series of strip drains. The recovered vapor condensate is returned into the product tanks. The strip drains lead to a 10,000-gallon underground oil/water separator tank, an underground sump, a 6,000-gallon aboveground-equalization tank, four particulate filter canisters, four 2,000-pound carbon treatment vessels, and ultimately the main oil/water separator.

In 2008, Shell upgraded the east spur of the rail car unloading area. The new spur is used for off-loading ethanol and aviation gasoline. The new spur containing drip pans is tied into a new process drain line which is tied into the existing west spur process drain line. The drain line discharges into a sump. The contact water in the sump is pumped to Tank 80001. The water is then routed to the loading rack treatment system described above.

Product storage tanks

Storage tanks were first installed on-site in 1947 and continue to be installed on an as-needed basis for expansion. The last tank, a 10,000-gallon additive tank, was installed in 2015. Some tanks have been retrofitted with double bottoms through the years. Dome covers have been installed over the original open floating roof to eliminate stormwater from seeping into the product tank. The total bulk storage capacity at the north and main tank farm is 696,000 barrels (bbl). Tank sizes range from 1,000-gallon to 4.75-million-gallon capacity.

The tanks are connected with five active transfer pipelines from the dock. Most of these lines are buried underground, with a portion of each line exposed aboveground in the tank farm. Transfer points are at two locations on the east side of the pier. Product movement is controlled at these two points by valves on individual lines. Also, new block valves control movement of product off the pier at the shore end, as well as in the tank farm 1/4 miles south. Most of these lines are buried underground. A small portion of the line is exposed aboveground.

Wastewater management and treatment systems

Wastewater generated from the main terminal consists of 90% stormwater and 10% process wastewater. Stormwater drained from the active area of the site is discharged to the main oil water separator (OWS) in conjunction with a zinc treatment system prior to discharge to Outfall 001 (via city storm drain line at the intersection of SW Lander Street and 13th Avenue SW). Stormwater from the roadway and parking area for trucks that are waiting to be loaded is drained to an underground OWS which ultimately drains to Outfall 002 to the city storm drain line on the west side of 16th Avenue SW. Process wastewater consists of a small volume of stormwater getting into the truck-loading area, intermittent spillage and washwater from the loading rack, intermittent product tank water draws water used to test pipelines and hoses (hydrotest water), etc. This water is treated through an underground OWS tank (UG-4), followed by granulated activated carbon system, which then drains to the main OWS and discharges through Outfall 001.

A zinc treatment system was integrated with the main oil/water separator in 2005 to treat stormwater so that discharge through Outfall 001 meets the permit limit for zinc. Water from the second chamber of the oil/water separator is pumped to the zinc treatment system, which consists of two treatment vaults with filter media that are located immediately west of the oil/water separator. After the water flows by gravity through the vaults, it returns to the final chamber of the main oil/water separator for discharge through Outfall 001.

Summary of compliance with previous permit issued February 16, 2010

The copper, lead and zinc data submitted during the last permit cycle, appear to exceed water quality standards periodically. A reasonable potential calculation to exceed water quality standards was performed which indicated limitation is needed to be imposed in the permit. However, due to the fact that majority of the discharge for this site is stormwater runoff (90%), rather than setting water quality standards, Ecology has determined it would be appropriated to set bench mark values for these heavy metals in order to be consistent with those in the Industrial Stormwater General Permit.

Discharge outfalls

This permit regulates two outfalls—Outfalls 001 and 002. Outfall 001 discharges treated effluent from the main OWS to the Duwamish River West Waterway via city storm sewers (SW Lander CSO/SD 105). This wastewater is impacted by industrial activities. Outfall 002 discharges treated storm runoff collected in an OWS. Outfall 002 discharges stormwater runoff into the City of Seattle storm sewer along SW 16th Avenue, which ultimately discharges to the Duwamish River West Waterway.

B. Permit status

The previous permit for this facility was issued on February 16, 2010, with an expiration date of February 16, 2015. The previous permit placed effluent limitations on oil & grease, total suspended solids (TSS), benzene, ethylbenzene, zinc, and pH.

An application for permit renewal was submitted on August 12, 2014, and accepted by Ecology on February 4, 2015.

C. Description of the receiving water

Harbor Island is located approximately one mile southwest of downtown Seattle and lies at the mouth of the Duwamish West Waterway on the southern edge of Elliott Bay. The island is man-made and has been used for industrial purposes since about 1912. Harbor Island is bordered by the East Waterway and West Waterway of the Duwamish West Waterway and by Elliott Bay on the north.

Shell discharges to the Duwamish River West Waterway. Ecology will base effluent limitations on marine water quality standards due to the location of the facility at the northwest corner of Harbor Island. Other nearby point source outfalls include those for Vigor Shipyards and other industries located on Harbor Island. Significant nearby sources of pollutants include combined sewage overflows. Designated uses under WAC 173-201A include the following:

> Water supply (industrial, agricultural); stock watering and harvesting; wildlife habitat; boating and aesthetic enjoyment; commerce and navigation.

Under the federal Clean Water Act (CWA), Section 303(d), the Duwamish West Waterway is currently listed as a water body failing to attain sediment quality standards. The lower 5 miles of the Duwamish was declared a superfund site by the United States Environmental Protection Agency.

D. Wastewater characterization

Shell reported the concentration of pollutants in the discharge in the permit application and in discharge monitoring reports. The following tabulated data also includes Ecology inspection monitoring results. The tabulated data represents the quality of the wastewater effluent discharged from January 2010 to December 2014. The wastewater effluent is characterized as follows:

Table 2. Wastewater Characterization

Parameter	Units	# of Samples	Average Monthly Value	Maximum Value
Flow	gpd	--	**80,600**	**318,000**
BTEX	µg/L	**58**	**3.41**	**28.2**
Benzene	µg/L	**58**	**0.450**	**3.9**
BOD_5	mg/L	**58**	**8.15**	**110**
Copper	**µg/L**	**58**	**7.76**	**22**
Ethylbenzene	**µg/L**	**58**	**0.32**	**6.4**
Lead	**µg/L**	**58**	**17.3**	**200**
Zinc	**µg/L**	**58**	**49.7**	**190**
Oil & grease	mg/L	**58**	**5.02**	**6.1**
TPH-G_x	mg/L	**58**	**0.02**	**0.18**
TSS	mg/L	**58**	**6.61**	**58**

Parameter	Units	# of Samples	Minimum Value	Maximum Value
pH	standard units	**55**	**7**	**11**

E. Summary of compliance with previous permit issued February 16, 2010

The previous permit placed effluent limits on pH, oil & grease, total suspended solids, benzene, ethyl benzene, and zinc.

Shell has complied with the effluent limits and permit conditions throughout the duration of the permit issued on February 16, 2010, except for a few occasions. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections.

The following table summarizes the violations that occurred during the permit term.

Table 3. Values Reported by the Permittees

Date	Zinc (µg/L)	TSS (mg/L)	pH (s.u.)
2/1/2010		72	
12/1/2010	110		
2/1/2011	99		
5/1/2011	140		
6/1/2011	140		11
5/1/2012	150		
6/1/2012	98		
12/1/2012	190	58	
Daily Maximum Limits	*95*	*33*	*8.5*

Warning letters were issued for the above violations. The facility is generally proactive about taking action to perform maintenance on the treatment system, and verify compliance with sampling afterward.

The copper, lead, and zinc data submitted during the last permit cycle appear to exceed water quality standards periodically. A reasonable potential calculation to exceed water quality standards was performed which indicated limitation is needed to be imposed in the permit. However, due to the fact that a majority of the discharge for this site is stormwater runoff (90%), rather than setting water quality standards, Ecology has determined it would be appropriate to set benchmark values for these heavy metals in order to be consistent with those in the Industrial Stormwater General Permit.

F. State Environmental Policy Act (SEPA) compliance

State law exempts the issuance, reissuance, or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions that are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applied only to existing discharges, not to new discharge.

III. Proposed permit limits

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the National Toxics Rule (40 CFR 131.36).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Ecology does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent [40 CFR 122.42(a)]. Until Ecology modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

A. Design criteria

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. The combined storage capacity of the OWSs and piping are designed to adequately contain a 10-year/24-hour storm event. The main OWS was constructed in 1947 and modified in October 2005.

The facility installed two storm filters to reduce zinc concentrations in the stormwater. Shell completed the AKART Study and the Engineering Report for this in December 2004 and May 2005, respectively.

Table 4. Design Criteria for Storm Filters

Parameter	Design Quantity
Maximum design flow for each storm filter	260 gpm

B. Technology-based effluent limits

Ecology may base effluent limits on the technology available to treat the pollutants at a reasonable cost (technology-based) or it may base them on the effect of the pollutants in the receiving water (water quality-based), whichever is most stringent. The technology-based effluent limitations in this permit are as follows:

Table 5. Technology-based Limits

Outfall	Parameter	Average Monthly Limit	Maximum Daily Limit
001, 002	Oil & grease	10 mg/L	15 mg/L
001, 002	Oily sheen	No oily sheen	No oily sheen
001	TSS	21 mg/L	33 mg/L

Outfall	Parameter	Daily Minimum	Daily Maximum
001, 002	pH	6.0 standard units	9.0 standard units

The oil & grease and TSS limits have remain unchanged from the previous permit. Ecology based the limits on the performance of similar facilities, the proven performance of gravity oil/water separators, and its best professional judgment (BPJ).

The surface water quality-based limit for pH (not outside the range of 6.5 to 8.5 standard units) was set in the previous permit. Ecology proposes this limit be replaced with a technology-based limit of not outside the range of 6 and 9 standard units. The reason for this change is due to the strongly stratified salt-wedge in the vicinity of the outfall where fresh water flows over the top of a salt wedge which provides much buffering capacity for pH.

Table 6. Benchmark Values

Outfall	Parameter	Benchmark Value [a]
001	Lead (as Total)	81.6 µg/L
001, 002	Copper (as Total)	14 µg/L
002	Zinc (as Total)	117 µg/L
001, 002	Turbidity	25 NTU

[a] If any of the benchmark values have been exceeded, the Permittee must proceed with the corrective actions as outlined in S11 of the permit.

Since 90% of the discharge from this facility is stormwater, the above benchmark values have been added to the permit in order to be consistent with the requirements set forth in the Industrial Stormwater General Permit.

For outfall 001, no benchmark value for zinc is proposed because a water quality based-limit already existed in the previous two cycles of the permit, Ecology proposes the zinc limit to remain the same in this permit without changing it to a benchmark value in order to comply with the anti-back sliding provision in 40 CFR 122.

C. Surface water quality-based effluent limits

The Washington State surface water quality standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

Numerical criteria for the protection of aquatic life and recreation

Numerical water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Table 7. Water Quality-Based Effluent Limits

Outfall	Parameter	Maximum Daily (marine acute criterion)
001	Zinc	95 µg/L

Numerical criteria for the protection of human health

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA, 1992). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

A human health-based limit of 71 µg/L for benzene with a monthly monitoring requirement was set in the 2003 permit because data indicated there was reasonable potential to exceed water quality standard. Since then, the facility has rerouted the concentrated waste streams, and added a carbon treatment system to treat the waste streams. Based on the last ten years of monitoring data, the measured concentration has been reported in the range of 2 to 4 µg/L. The reasonable potential calculation was conducted again, and it indicates there is no reasonable potential to exceed water quality standard. Thus, Ecology proposes to remove the effluent limit and monitoring requirement for benzene in this permit.

Narrative criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210, 2006) in the state of Washington.

Antidegradation

Description--The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

Facility Specific Requirements--This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.
- For waters that do not meet assigned criteria, or protect existing or designated uses, Ecology will take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards.

- Whenever the natural conditions of a water body are of a lower quality than the assigned criteria, the natural conditions constitute the water quality criteria. Where water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in chapter 173-201A WAC.

Ecology's analysis described in this section of the fact sheet demonstrates that the proposed permit conditions will protect existing and designated uses of the receiving water.

Mixing zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn't interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and must not use more than 25% of the available width of the water body for dilution [WAC 173-201A-400 (7)(a)(ii-iii)].

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's *Permit Writer's Manual*). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

There is no mixing zone granted in the proposed permit for Shell's discharge.

D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). The table included below summarizes the criteria applicable to this facility's discharge.

- Aquatic Life Uses are designated based on the presence of, or the intent to provide protection for the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The Aquatic Life Uses for this receiving water are identified below.

Table 8. Marine Aquatic Life Uses and Associated Criteria

Excellent Quality	
Temperature Criteria – Highest 1D MAX	16°C (60.8°F)
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	6.0 mg/L
Turbidity Criteria	• 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
pH Criteria	pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

- To protect shellfish harvesting, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.
- The recreational uses for this receiving water are identified below.

Table 9. Recreational Uses

Recreational Use	**Criteria**
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies /100 mL.

- The *miscellaneous marine water uses* are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

E. Water quality impairments

Shell discharges to Duwamish West Water Way, which is included in the Section 303(d) list for exceeding sediment quality standards.

F. Evaluation of surface water quality-based effluent limits for narrative criteria

Ecology must consider the narrative criteria described in WAC 173-201A-160 when it determines permit limits and conditions. Narrative water quality criteria limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health.

Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements all known, available, and reasonable methods of treatment and prevention (AKART) as described above in the technology-based limits section. When Ecology determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

In addition, Ecology considers the toxicity of the wastewater discharge by requiring whole effluent toxicity (WET) testing when there is a reasonable potential for the discharge to contain toxics. Ecology's analysis of the need for WET testing for this discharge is described later in the fact sheet.

G. Evaluation of surface water quality-based effluent limits for numeric criteria

Ecology has not authorized a mixing zone in the permit.

H. Human health

Washington's water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

Ecology evaluated the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) and Ecology's *Permit Writer's* Manual to make a reasonable potential determination. Data (58 data points) from the previous permit cycle were used to perform the evaluation (See Appendix D – Technical Calculations). The evaluation showed that the discharge has no reasonable potential to cause a violation of water quality standards, and an effluent limit is not needed. Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards.

I. Sediment quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). Additional information about sediments can be obtained at the Aquatic Lands Cleanup Unit website. http://www.ecy.wa.gov/programs/tcp/smu/sediment.html

Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards.

J. Groundwater quality limits

The groundwater quality standards (chapter 173-200 WAC) protect beneficial uses of groundwater. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

Shell does not discharge process wastewater to the ground. Stormwater falls within the tank farm is infiltrate to the ground surface because the tank farm is not paved due to the Fire Department's fire code prohibition.

K. Whole effluent toxicity

The water quality standards for surface waters forbid discharge of effluent that has the potential to cause toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

- *Acute toxicity tests measure mortality as the significant response* to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.
- *Chronic toxicity tests measure various sublethal toxic responses*, such as reduced growth or reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure survival.

Laboratories accredited by Ecology for WET testing know how to use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know how to calculate an NOEC, LC50, EC50, IC25, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (https://fortress.wa.gov/ecy/publications/SummaryPages/9580.html) which is referenced in the permit. Ecology recommends that each regulated facility send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

During the previous permit term, the facility conducted effluent characterization for acute and chronic toxicity, and data indicate no toxicity was detected in the effluent. Ecology proposes the facility to repeat this effluent characterization at the end of this permit cycle as part of the permit application due to the fact that new sources of wastewater have been added to the carbon treatment system. The sources include the railcar unloading area drip trays, tank water draws, and water used to test pipelines and hoses (hydrotest water).

L. Comparison of effluent limits with the previous permit issued on February 16, 2010

Table 10. Comparison of Existing and Proposed Effluent Limits

		Existing Effluent Limits:		**Proposed Effluent Limits:**	
Parameter Outfalls 001, 002	**Basis of Limit**	**Limit**		**Limit**	
pH	Water Quality	Between the range of 6.5 and 8.5 standard units.		---	
pH	Technology	---		Between the range of 6 and 9 standard units	
Parameter Outfall 001	**Basis of Limit**	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
Oil and Grease	Technology	10 mg/L	15 mg/L	10 mg/L	15 mg/L
Oily Sheen	Water Quality	---	No oily sheen	---	No oily sheen
Total Suspended Solids (TSS)	Technology	21 mg/L	33 mg/L	21 mg/L	33 mg/L
Benzene	Human Health	---	71 µg/L	---	*
Ethyl benzene	Water Quality	---	0.100 mg/L	---	**
Zinc (as Total)	Water Quality	---	95 µg/L	---	95 µg/L
Parameter Outfall 001	**Basis of Limit**	**Bench Mark Value**		**Bench Mark Value**	
Copper (as Total)	Bench Mark	---		14 µg/L	
Lead (as Total)	Bench Mark	---		81.6 µg/L	
Turbidity	Bench Mark	---		25 NTU	
Parameter Outfall 002	**Basis of Limit**	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
Oil and Grease	Technology	10 mg/L	15 mg/L	10 mg/L	15 mg/L
Oily Sheen	Water Quality	---	No oily sheen	---	No oily sheen
Parameter Outfall 002	**Basis of Limit**	**Bench Mark Value**		**Bench Mark Value*** **	
Copper (as Total)	Bench Mark	---		14 µg/L	
Zinc (as Total)	Bench Mark	---		117 µg/L	
Turbidity	Bench Mark	---		25 NTU	

* A reasonable potential to exceed water quality standard calculation was performed for benzene using the last five years data, and the calculation indicates there is no reasonable potential to exceed water quality standard. Thus, Ecology proposes the previously set water quality-based effluent limit for benzene be removed in this permit.

** Ecology proposes to remove the previously set technology-based effluent limit for ethyl-benzene because data show the reported concentrations are consistently low. The reasonable potential to exceed water quality standard calculation was also performed using the last five years' data, and the calculation indicates there is no reasonable potential to exceed water quality standard.

*** If any of the benchmark values have been exceeded, the Permittee must proceed with the corrective actions as outlined in S11 of the permit.

IV. Monitoring requirements

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the methods and meets or exceeds the method detection levels required by the permit. The permit describes when facilities may use alternative methods. It also describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method, detection level (DL), and quantitation level (QL) on the discharge monitoring report or in the required report.

A. Wastewater monitoring

Shell monitors for BOD_5, copper, lead, TPH-G, and whole effluent toxicity testing to further characterize the effluent. These pollutants could have a significant impact on the quality of the surface water.

The monitoring schedule is detailed in the proposed permit under Special Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

B. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters).

V. Other permit conditions

A. Reporting and record keeping

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

B. Non-routine and unanticipated wastewater

Occasionally, this facility may generate wastewater which was not characterized in the permit application because it is not a routine discharge and was not anticipated at the time of application. These wastes typically consist of waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems.

The permit authorizes the discharge of non-routine and unanticipated wastewater under certain conditions. The facility must characterize these waste waters for pollutants and examine the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and on any opportunities for reuse, Ecology may:

- Authorize the facility to discharge the wastewater.
- Require the facility to treat the wastewater.
- Require the facility to reuse the wastewater.

C. Spill plan

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

Shell developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the facility to update this plan and submit it to Ecology.

D. Operation and maintenance manual

Ecology requires industries to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state and federal regulations [40 CFR 122.41(e) and WAC 173-220-150 (1)(g)]. The facility has prepared and submitted an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit.

E. Stormwater pollution prevention plan

In accordance with 40 CFR 122.44(k) and 40 CFR 122.44 (s), the proposed permit includes requirements for the development and implementation of a SWPPP along with BMPs to minimize or prevent the discharge of pollutants to waters of the state. BMPs constitute Best Conventional Pollutant Control Technology (BCT) and Best Available Technology Economically Achievable (BAT) for stormwater discharges. Ecology has determined that Shell must develop a SWPPP and implement adequate BMPs in order to meet the requirements of "all known, available, and reasonable methods of prevention, control, and

treatment" (AKART). A SWPPP requires a facility to implement actions necessary to manage stormwater to comply with the state's requirement under chapter 90.48 RCW to protect the beneficial uses of waters of the state.

The SWPPP must identify potential sources of stormwater contamination from industrial activities and identify how it plans to manage those sources of contamination to prevent or minimize contamination of stormwater. Shell must continuously review and revise the SWPPP as necessary to assure that stormwater discharges do not degrade water quality. It must retain the SWPPP on-site or within reasonable access to the site and available for review by Ecology.

Best management practices (BMPs)

BMPs are the actions identified in the SWPPP to manage, prevent contamination of, and treat stormwater. BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs also include treatment systems, operating procedures, and practices used to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage. Shell must ensure that its SWPPP includes the operational and structural source control BMPs listed as "applicable" in Ecology's stormwater management manuals. Many of these "applicable" BMPs are sector-specific or activity-specific, and are not required at facilities engaged in other industrial sectors or activities.

Ecology-approved stormwater management manuals

Consistent with RCW 90.48.555 (5) and (6), the proposed permit requires the facility to implement BMPs contained in the *Stormwater Management Manual for Western Washington* (*2005* edition), or any revisions thereof, or practices that are demonstrably equivalent to practices contained in stormwater technical manuals approved by Ecology. This should ensure that BMPs will prevent violations of state water quality standards, and satisfy the state AKART requirements and the federal technology-based treatment requirements under 40 CFR part 125.3. The SWPPP must document that the BMPs selected, provide an equivalent level of pollution prevention, compared to that specified in the applicable stormwater management manuals, including: The technical basis for the selection for all stormwater BMPs (scientific, technical studies, and/or modeling) which support the performance claims for the BMPs selected.

An assessment of how the BMPs will satisfy AKART requirements and the applicable technology-based treatment requirements under 40 CFR part 125.3.

Operational source control BMPs

Operational source control BMPs include a schedule of activities, prohibition of practices, maintenance procedures, employee training, good housekeeping, and other managerial practices to prevent or reduce the pollution of waters of the state. These activities do not require construction of pollution control devices but are very important components of a successful SWPPP. Employee training, for instance, is critical to achieving timely and consistent spill response. Pollution prevention is likely to fail if the employees do not understand the importance and objectives of BMPs. Prohibitions might include eliminating outdoor repair work on equipment and certainly would include the

elimination of intentional draining of crankcase oil on the ground. Good housekeeping and maintenance schedules help prevent incidents that could result in the release of pollutants. Operational BMPs represent a cost-effective way to control pollutants and protect the environment. The SWPPP must identify all the operational BMPs and how and where they are implemented. For example, the SWPPP must identify what training will consist of, when training will take place, and who is responsible to assure that employee training happens.

Structural source control BMPs

Structural source control BMPs include physical, structural, or mechanical devices or facilities intended to prevent pollutants from entering stormwater. Examples of source control BMPs include erosion control practices, maintenance of stormwater facilities (e.g., cleaning out sediment traps), construction of roofs over storage and working areas, and direction of equipment wash water and similar discharges to the sanitary sewer or a dead end sump. Structural source control BMPs likely include a capital investment but are cost effective compared to cleaning up pollutants after they have entered stormwater.

Treatment BMPs

Operational and structural source control BMPs are designed to prevent pollutants from entering stormwater. However, even with an aggressive and successful program, stormwater may still require treatment to achieve compliance with water quality standards. Treatment BMPs remove pollutants from stormwater. Examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Volume/flow control BMPs

Ecology recognizes the need to include specific BMP requirements for stormwater runoff quantity control to protect beneficial water uses, including fish habitat. New facilities and existing facilities undergoing redevelopment must implement the requirements for peak runoff rate and volume control identified by volume 1 of the *Western Washington SWMM* and chapter 2 in the *Eastern Washington SWMM* as applicable to their development. Chapter 3 of volume 3 *Western Washington SWMM* and chapter 6 in the *Eastern Washington SWMM* lists BMPs to accomplish rate and volume control. Existing facilities in western Washington should also review the requirements of volumes 1 (Minimum Technical Requirements) and chapter 3 of volume 3 in the *Western Washington SWMM*. Chapter 2 (Core Elements for New Development and Redevelopment) in the *Eastern Washington SWMM* contains the minimum technical requirements for facilities east of the Cascades. Although not required to implement these BMPs, controlling rate and volume of stormwater discharge maintains the health of the watershed. Existing facilities should identify control measures that they can implement over time to reduce the impact of uncontrolled release of stormwater.

Shell must update its SWPPP whenever there is change made in design, construction, operation or maintenance which causes the SWPPP to be less effective in controlling pollutants. This permit requires the updated SWPPP to be submitted along with the permit application.

F. General conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual industrial NPDES permits issued by Ecology.

VI. Permit issuance procedures

A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for groundwater, after obtaining new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

B. Proposed permit issuance

This proposed permit includes all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of 5 years.

VII. References for text and appendices

Environmental Protection Agency (EPA)

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1985. *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water*. EPA/600/6-85/002a.

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1972. *Characterization of Stream Reaeration Capacity*. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

December 2011. *Permit Writer's Manual*. Publication Number 92-109 (https://fortress.wa.gov/ecy/publications/SummaryPages/92109.html)

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October 2010 (revised). *Water Quality Program Guidance Manual – Procedures to Implement the State's Temperature Standards through NPDES Permits*. Publication Number 06-10-100 (https://fortress.wa.gov/ecy/publications/summarypages/0610100.html)

Laws and Regulations (http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/permits/guidance.html)

February 2007. *Focus Sheet on Solid Waste Control Plan, Developing a Solid Waste Control Plan for Industrial Wastewater Discharge Permittees*, Publication Number 07-10-024. http://www.ecy.wa.gov/pubs/0710024.pdf

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1979. *In-stream Deoxygenation Rate Prediction*. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

Appendix A—Public involvement information

Ecology proposes to reissue a permit to Shell Oil Products, US. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Draft on January 19, 2016, in *The Seattle Times* to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Told where copies of the draft Permit and Fact Sheet were available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website).
- Offered to provide the documents in an alternate format to accommodate special needs.
- Urged people to submit their comments, in writing, before the end of the Comment Period.
- Told how to request a public hearing of comments about the proposed NPDES permit.
- Explained the next step(s) in the permitting process.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting* which is available on our website at https://fortress.wa.gov/ecy/publications/SummaryPages/0307023.html.

You may obtain further information from Ecology by telephone, 425-649-7201, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

The primary author of this permit and fact sheet is Jeanne Tran, P.E.

Appendix B—Your right to appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Appendix C—Glossary

1-DMax or 1-day maximum temperature -- The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures -- The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute toxicity -- The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

AKART -- The acronym for "all known, available, and reasonable methods of prevention, control and treatment." AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance -- An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An "early warning value" must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality -- The existing environmental condition of the water in a receiving water body.

Ammonia -- Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual average design flow (AADF) -- The average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly (intermittent) discharge limit -- The average of the measured values obtained over a calendar month's time taking into account zero discharge days.

Average monthly discharge limit -- The average of the measured values obtained over a calendar month's time.

Background water quality -- The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time upgradient of an activity that has not been affected by that activity [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

Best management practices (BMPs) -- Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD5 -- Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD_5 is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass -- The intentional diversion of waste streams from any portion of a treatment facility.

Categorical pretreatment standards -- National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

Chlorine -- A chemical used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic toxicity -- The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean water act (CWA) -- The federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance inspection-without sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance inspection-with sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite sample -- A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction activity -- Clearing, grading, excavation, and any other activity, which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous monitoring -- Uninterrupted, unless otherwise noted in the permit.

Critical condition -- The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Date of receipt -- This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Detection limit -- The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Dilution factor (DF) -- A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Distribution uniformity -- The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Early warning value -- The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, groundwater, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

Enforcement limit -- The concentration assigned to a contaminant in the groundwater at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a groundwater criterion will not be exceeded and that background water quality will be protected.

Engineering report -- A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal coliform bacteria -- Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab sample -- A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Groundwater -- Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Industrial user -- A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial wastewater -- Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated stormwater and, also, leachate from solid waste facilities.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Local limits -- Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

Major facility -- A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum daily discharge limit -- The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum day design flow (MDDF) -- The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) -- The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) -- The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method detection level (MDL) -- See Detection Limit.

Minor facility -- A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing zone -- An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).

National pollutant discharge elimination system (NPDES) -- The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

pH -- The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Pass-through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

Peak hour design flow (PHDF) -- The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

Peak instantaneous design flow (PIDF) -- The maximum anticipated instantaneous flow.

Point of compliance -- The location in the groundwater where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the groundwater as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Potential significant industrial user (PSIU) -- A potential significant industrial user is defined as an Industrial User that does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day; or

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation level (QL) -- Also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and

cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer (64 FR 30417).
ALSO GIVEN AS:
The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency, December 2007).

Reasonable potential -- A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

Responsible corporate officer -- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sample Maximum -- No sample may exceed this value.

Significant industrial user (SIU) --

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

   Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

   *The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

Slug discharge -- Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW's regulations and local limits.

Soil scientist -- An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting

Scientists or who has the credentials for membership. Minimum requirements for eligibility are possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 year(s), respectively, of professional experience working in the area of agronomy, crops, or soils.

Solid waste -- All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

Soluble BOD_5 -- Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD_5 test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD_5 test is sufficient to remove the particulate organic fraction.

State waters -- Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater -- That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit -- A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria -- A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids -- That portion of total solids in water or wastewater that passes through a specific filter.

Total maximum daily load (TMDL) -- A determination of the amount of pollutant that a water body can receive and still meet water quality standards.

Total suspended solids (TSS) -- Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset -- An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water quality-based effluent limit -- A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D—Technical calculations

Reasonable Potential Calculation

Facility	Shell Oil - Seattle Terminal
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	1.0	1.0
Human Health Carcinogenic		1.0
Human Health Non-Carcinogenic		1.0

Pollutant, CAS No. & NPDES Application Ref. No.		BENZENE 71432 3V	ETHYLBENZENE 100414 19V										
Effluent Data	# of Samples (n)	58	58										
	Coeff of Variation (Cv)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)												
	Calculated 50th percentile Effluent Conc. (when n>10)	0.15	0.15										
Receiving Water Data	90th Percentile Conc., ug/L												
	Geo Mean, ug/L	1.044	0.584										
Water Quality Criteria	Aquatic Life Criteria, ug/L — Acute	-	-										
	Aquatic Life Criteria, ug/L — Chronic	-	-										
	WQ Criteria for Protection of Human Health, ug/L	71	29000										
	Metal Criteria Translator, decimal — Acute	-	-										
	Metal Criteria Translator, decimal — Chronic	-	-										
	Carcinogen?	Y	N										

Aquatic Life Reasonable Potential

Effluent percentile value													
s	$s^2=\ln(CV^2+1)$												
Pn	$Pn=(1\text{-confidence level})^{1/n}$												
Multiplier													
Max concentration (ug/L) at edge of...	Acute												
	Chronic												
Reasonable Potential? Limit Required?													

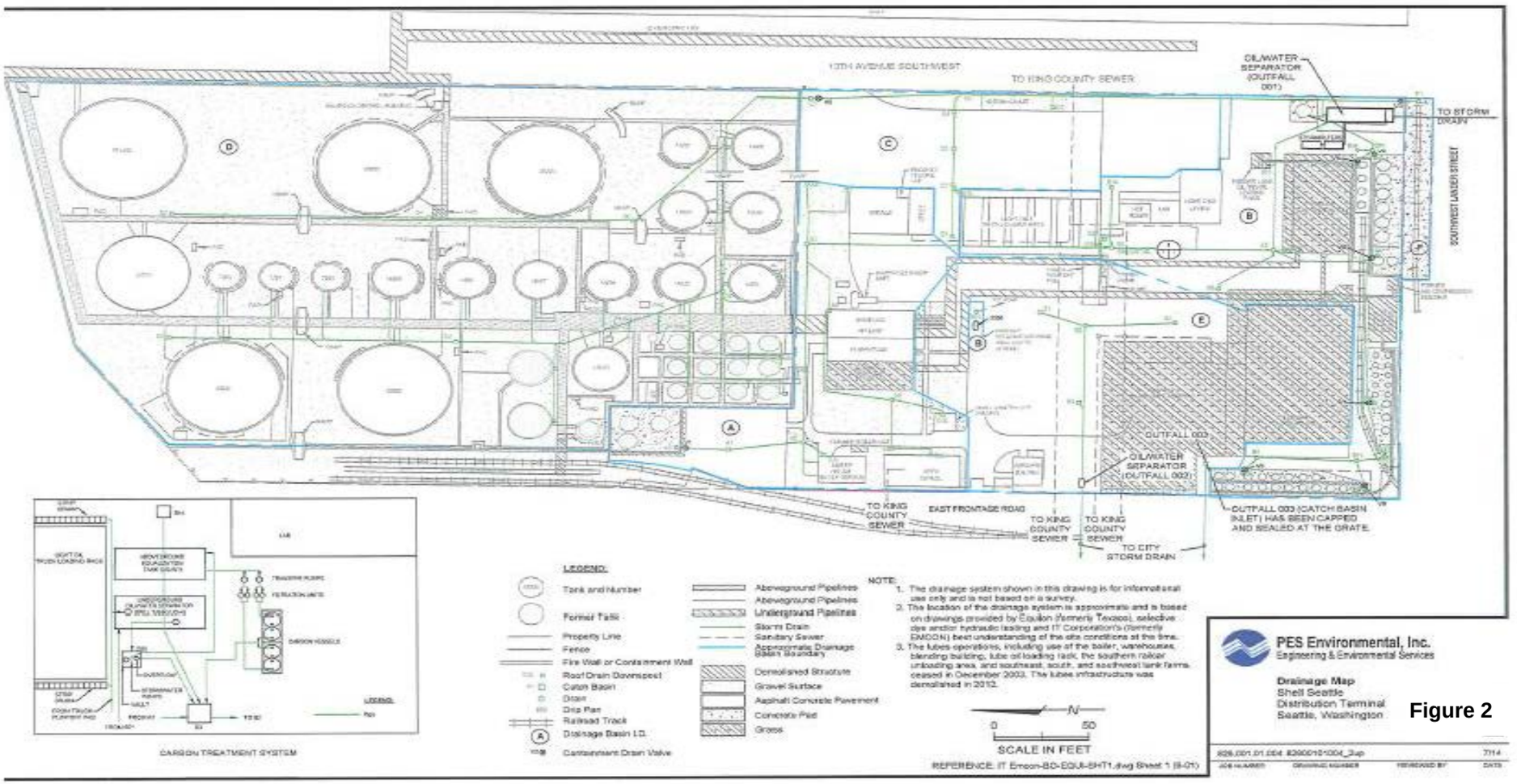
Aquatic Life Limit Calculation

# of Compliance Samples Expected per month													
LTA Coeff. Var. (CV), decimal													
Permit Limit Coeff. Var. (CV), decimal													
Waste Load Allocations, ug/L	Acute												
	Chronic												
Long Term Averages, ug/L	Acute												
	Chronic												
Limiting LTA, ug/L													
Metal Translator or 1?													
Average Monthly Limit (AML), ug/L													
Maximum Daily Limit (MDL), ug/L													

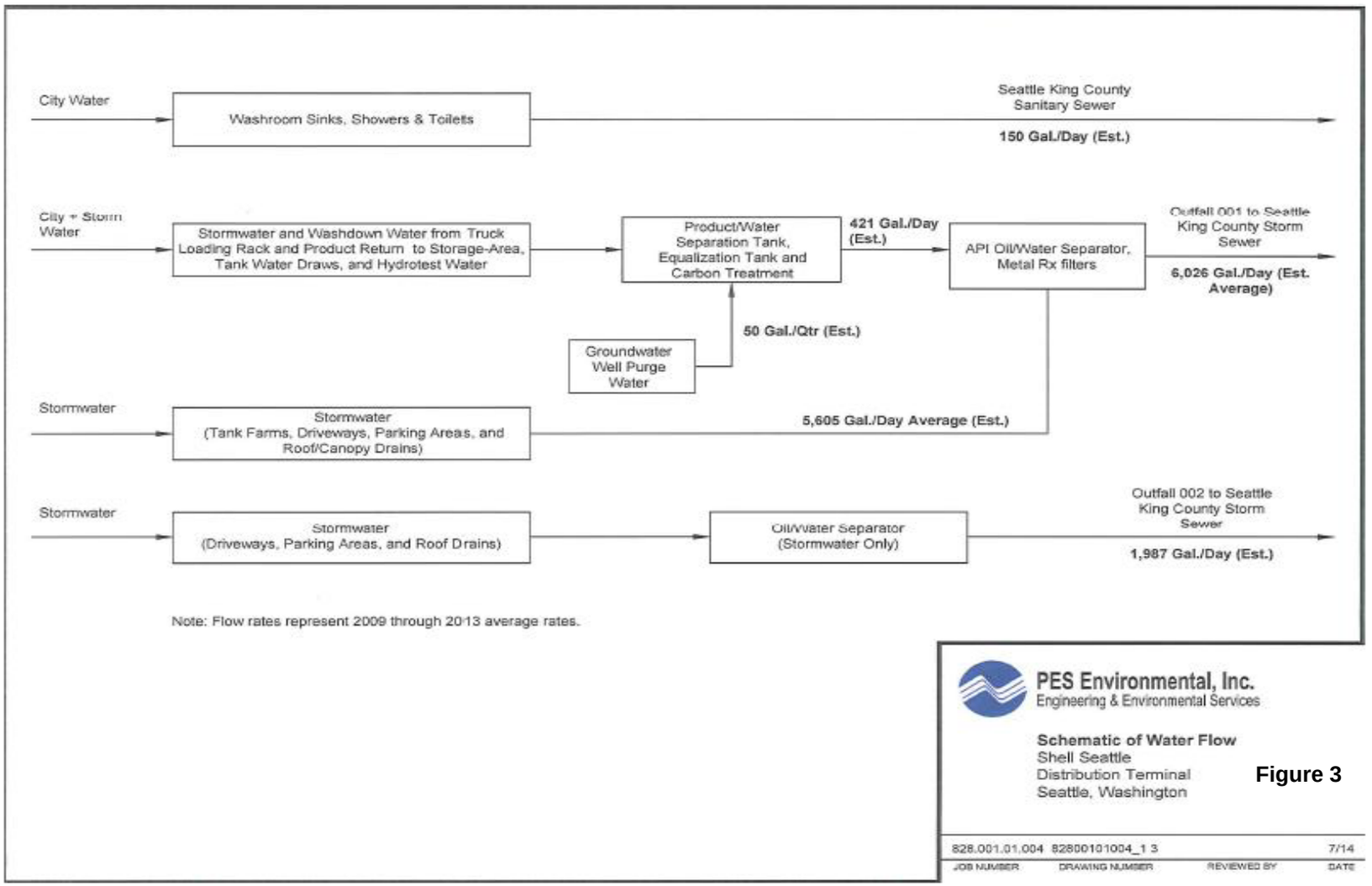
Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.5545	0.5545										
Pn	Pn=(1-confidence level)1/n	0.950	0.950										
Multiplier		0.4024	0.4024										
Dilution Factor		1	1										
Max Conc. at edge of Chronic Zone, ug/L		0.15	0.15										
Reasonable Potential? Limit Required?		**NO**	**NO**										

Appendix E—Site maps



Main


City Water
Washroom Sinks, Showers & Toilets
Seattle King County Sanitary Sewer
150 Gal./Day (Est.)
City + Storm Water
Stormwater and Washdown Water from Truck Loading Rack and Product Return to Storage-Area, Tank Water Draws, and Hydrotest Water
Product/Water Separation Tank, Equalization Tank and Carbon Treatment
421 Gal./Day (Est.)
API Oil/Water Separator, Metal Rx filters
Outfall 001 to Seattle King County Storm Sewer
6,026 Gal./Day (Est. Average)
50 Gal./Qtr (Est.)
Groundwater Well Purge Water
Stormwater
Stormwater (Tank Farms, Driveways, Parking Areas, and Roof/Canopy Drains)
5,605 Gal./Day Average (Est.)
Stormwater
Stormwater (Driveways, Parking Areas, and Roof Drains)
Oil/Water Separator (Stormwater Only)
Outfall 002 to Seattle King County Storm Sewer
1,987 Gal./Day (Est.)
Note: Flow rates represent 2009 through 2013 average rates.
PES Environmental, Inc.
Engineering & Environmental Services
Schematic of Water Flow
Shell Seattle
Distribution Terminal
Seattle, Washington
Figure 3
828.001.01.004
828001101004_1 3
7/14
JOB NUMBER
DRAWING NUMBER
REVIEWED BY
DATE

Appendix F—Response to Comments

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

May 4, 2016

Ms. Claire E. Tonry
Smith & Lowney, PLLC
2317 East John Street
Seattle, WA 98112

RE: Shell Oil Products Seattle Terminal Draft Individual NPDES Permit WA-0001791

Thank you for submitting your comments on the above-referenced draft permit, on behalf of Puget Soundkeeper Alliance (Soundkeeper). Ecology has made a thorough review of your comments, and Ecology offers the following responses.

Soundkeeper's Comment A: "The permit must impose effluent limits on discharges from the shoreline manifold and dock...The runoff from Shell's pier is stormwater associated with industrial activity. Specially, the facility falls within SIC code 5171, and Shell conducts vehicle maintenance, primarily fueling vessels, on the pier. As such, discharges from the pier require NPDES permit.

The draft fact sheet erroneously states that stormwater from Shell's portion of the Pier 15 dock is managed by Rainier Petroleum. Rainier Petroleum expressly disclaims any responsibility for stormwater discharges form Shell's portion of the pier, which is approximately the eastern half of the 590-foot long dock...Ecology should revise the draft permit to ensure discharges from Shell's portion of the pier, as well as any discharges from the manifold area, are subject to effluent limitations that reflect AKART and ensure compliance with water quality standards."

Ecology's Response: Ecology will add best management practices (BMPs) language for the dock (aka pier 15) and manifold area in the permit (please note that Ecology's Spills Prevention Unit in the Spills Program has already required Shell to develop and submit the Dock Operations Manual (DOM) and Prevention Plan. Both documents pertain to spills prevention. This Unit inspects, reviews, and approves the facility's DOM and Prevention Plan.) No effluent limits and monitoring requirements have been proposed for the stormwater in the manifold and dock because the only industrial activity is the piping of products. The pipes prevent contact of stormwater with petroleum products. Ecology agrees to add BMPs to the proposed permit as mentioned above, and concludes that stormwater from the dock is adequately addressed in the permit with this approach.

Stormwater associated with the portion of the pipelines used for barge unloading and formerly vessel fueling is captured in the two concrete containment areas, then drained to Rainier Petroleum's water sump tank located on the west side of the dock. This water is then pumped to the on-shore Water Tank #7 for treatment prior to discharge to the sanitary sewer by Rainier Petroleum. The discharge permit for this discharge is administered by King County's Industrial Wastewater Division. Ecology conducted two separate inspections in March 2016, at the dock and shoreline manifold to verify the information; please see attached inspection report.

Shell claims that no vehicle maintenance has been or will be conducted at the dock, and no vessel fueling is conducted at the dock. Pipeline fittings for vessel fueling were modified several years ago, such that Shell can no longer conduct vessel fueling at the dock. Shell periodically receives petroleum product by barge at the dock, transferring the product to pipelines running to the shoreline manifold area to the main tank farm.

Dock and Shoreline Manifold Description: Shell's shoreline manifold area and dock are located on the north side of the intersection of 13th Avenue SW and SW Massachusetts Street. The dock is also known as Pier 15, which extends 590 feet into Elliott Bay. Shell operates on the eastern portion of the dock, and Rainier Petroleum (Rainier) operates on the western portion of the dock. Shell indicates that they do not conduct industrial activities on the northern 170 feet of Shell's side of the dock. Stormwater which falls on this portion of the dock drains directly to Elliott Bay through holes in the dock surface.

The 75-foot long middle-northern portion of the dock includes the only portion of Shell's side of the dock with industrial activity. Shell periodically unloads petroleum product from barges in this area, transferring the product to pipelines running to the shoreline manifold area. All activities in this area are within containment, and stormwater drainage from this area is collected and transferred by means of piping to Rainier's collection sump located on the east side of the dock for handling. Rainier pretreats the water prior to discharge to the sanitary sewer through its discharge permit (Discharge Authorization No. 536-04) with King County's Industrial Wastewater Division. All eleven pipelines exiting this area toward the shore are un-flanged (welded and without connection fittings) between this area and the shoreline manifold area; five of the pipelines are used to transfer product to the main tank farm, and six have been cleaned and taken out of service.

The 80-foot long middle southern area of Shell's side of the dock is a former barge unloading area that is permanently out of service. Un-flanged product pipelines cross this area, but no industrial activities take place. Stormwater which falls in this area is also collected in the containment area and drained to Rainier's sump tank for treatment prior to discharge to sanitary sewer.

The southern 265 feet of Shell's side of the dock consists of un-flanged pipelines positioned on cast iron grates; no industrial activity takes place in this area. No stormwater is collected on Shell's side of the dock in this area since rain passes through the grates directly into Elliott Bay. The dock lies 250 feet to the west of the shoreline manifold area. Shell's eleven aboveground pipelines between the dock and the shoreline manifold area cross an unpaved portion of the property owned by Rainier Petroleum.

The 0.2-acre shoreline manifold area contains aboveground pipelines from the dock, manifolds controlling the flow of product between the dock and the main tank farm, a concrete containment pad beneath the manifold, a 2,000-gallon tank within a concrete containment area, and belowground pipelines to the main tank farm. A bulkhead on the north side of the shoreline manifold area separates the manifold area from Elliott Bay to the north. Almost of all of the shoreline manifold area is unpaved, covered with gravel, and all precipitation falling in this area infiltrates the unpaved surface. Stormwater collected in the two containment areas in the shoreline manifold area is inspected for evidence of product prior to opening the valve to drain it to the unpaved ground surface. If an oily sheen is observed, Shell's operational procedure is to contract a vacuum truck to come in to remove and dispose of the water. Ecology will require that this management practice specified in Shell's SWPPP.

In summary, Ecology believes that stormwater falling in the area which is associated with industrial activities in the shoreline manifold and dock areas is adequately addressed through BMPs, spill control measures, and diverting targeted sources to the sanitary sewer. Stormwater collected in the dock area in which industrial activities are conducted, is pretreated and discharged to the sanitary sewer by Rainier Petroleum. Stormwater collected in the containment pads in the shoreline area either infiltrates into the ground surface or is hauled off site for proper disposal, based on whether an oily sheen is observed on the water within the containment pads. Therefore, Ecology has determined that Shell's management of stormwater in the shoreline manifold and dock meets AKART requirements, and has determined that effluent limits and monitoring requirements for these areas are not required.

Soundkeeper's Comment B: "The permit must require applicable Stormwater Manual BMPs...Nothing in the draft permit actually requires the SWPPP to contain applicable SWMMWW BMPs or meet AKART. The only mention of the SWMMWW appears in Condition S11, the corrective action provisions, and is only triggered if Shell exceeds a benchmark for copper, lead, or turbidity."

Ecology's Response: Ecology will add language to the permit referencing the use of the SWMMWW. Shell's first SWPPP was prepared in the mid or late 1990s, and revised thereafter as the facility made improvements and changes to treat and manage process wastewater and stormwater. The original SWPPP requirement language was long and it referenced Ecology's Stormwater Management Manual to be used as a guide for applicable BMPs and treatment. The subsequently renewed permit contains shorter SWPPP language to require Shell to review and update the SWPPP whenever it makes changes to the plant that would affect the quality of stormwater, or at least once per permit cycle if there are no significant changes made to the plant. Shell has identified and implemented operational, source-control, and treatment BMPs for the existing and potential pollutant sources over the years. BMPs in place for each activity area are listed in the facility's SWPPP.

The main terminal and tank farm contain a variety of structures to manage and treat wastewater (See attached process flow diagram of the wastewater sources and treatment systems). The facility's primary wastewater sources consist of stormwater runoff from paved surfaces and roof drains, with lesser amounts of truck loading rack washwater and occasional discharges of hydrotest water and tank contact water. All process water (including stormwater runoff and washwater from the truck loading rack, dock pipeline hydrotest water and tank contact water) is treated by activated carbon filtration. This treated water and the entire site's stormwater runoff is routed to the main oil water separator, and the zinc treatment system prior to discharge to Outfall 001, on a batch basis. Stormwater discharge through outfall 002 is treated by a separate oil water separator. In summary, Ecology has determined that the BMPs and treatment technologies employed by Shell at the main terminal are consistent with SWMMWW BMPs.

Soundkeeper's Comment C: "The permit must impose numeric water quality-based effluent limitations for copper and lead at outfall 001...There is no apparent reason why Ecology cannot set a numeric limit for copper and lead using the exact same method it used to set the zinc limit. Ecology set numerical effluent limits for copper, lead, and zinc for stormwater discharges from the very nearby Vigor Shipyard in 2008 and again in the individual permit reissued in mid-2015. The water quality based effluent limits in Vigor's permit are 5.78 µg/L copper, 221 µg/L lead, and 95 µg/L zinc. Vigor's zinc limit is the same as Shell's zinc limit, presumably because both facilities discharge to the same water body and neither has a mixing zone. Wouldn't derivation of limits for the Shell Terminal be the same and yield these same copper and lead limits?

Soundkeeper requests Ecology impose numeric copper limit of no more than 5.78 µg/L. Soundkeeper anticipates that a technology-based limit for lead would be more stringent than the water quality based limit imposed on Vigor Shipyard. Ecology should conduct an analysis of Shell's lead monitoring data – all of which shows 10 µg/L lead or less – to derive a performance/technology based limit. Ecology recently took this approach to set lead limits for wastewater (largely stormwater) discharges from Seattle Iron & Metals' recycling facility not far upstream of Shell's Terminal. Soundkeeper requests that Ecology appropriately derive numeric water quality and technology based effluent limits for copper and lead for the Shell facility and impose the more stringent of the two, as required by WAC 173-220-130.

The fact sheet indicates that Ecology imposed only benchmarks for copper and lead "to be consistent with those in the Industrial Stormwater General Permit" – not because deriving numeric water quality based effluent limits is impracticable. Does Ecology contend that such consistency is a sufficient basis to ignore federal regulation? What is Ecology's rationale for choosing to be consistent with a general permit but inconsistent with an individual permit at an adjacent facility?"

Ecology's Response: Ecology imposes limits tailored to specific site conditions in individual permits. Benchmark values, calculated performance-based limits, and water quality standards for copper, lead, and zinc are summarized in Table 1. Shell's metals data collected during the last permit cycle (2010 to 2015) is presented below in Table 2. The proposed benchmark value is more stringent than the calculated performance-based limit for copper. The proposed benchmark value and the calculated performance-based limit for lead are not significantly different (10% difference). Ecology has determined that imposing benchmark values for stormwater discharges consistent with those in the Industrial Stormwater General permit is appropriate for stormwater discharges going into the City's storm sewer. Shell will need to reduce copper levels to attain the benchmark value. The control measures which are likely to have to be undertaken for copper, are also likely to reduce concentrations of other metals.

As for zinc, since a water quality based-limit for zinc already existed in the previous two cycles of the permit, Ecology proposes the zinc limit to remain the same in this draft permit without changing it to a benchmark value in order to comply with the anti-back sliding provision in 40 CFR 122.

Table 1: Limits and Benchmarks Comparison

Basis for Limits and Benchmarks	Copper µg/L	Lead µg/L	Zinc µg/L
Benchmark Values	14	81.6	117
Performance Based-limits			
Daily Maximum Limits	24.6	73.7	265.5
Average Monthly Limits	12.1	27.6	102.4
Water Quality Criteria (as Total)			
Chronic	3.73	8.53	85.6
Acute	5.78	221	95

The proposed limit and bench mark values in Shell's permit are those hi-lighted in yellow.

Shell's discharge configuration is different than Vigor Shipyards' and Seattle Iron and Metals' situations. Shell discharges to the City's storm sewer and its effluent is well mixed with other stormwater. Vigor Shipyards and Seattle Iron and Metals discharge directly to the receiving water. Vigor Shipyards discharges stormwater collected from the heavy industrial area to the sanitary sewer system, and has not discharged directly to surface water through its outfall. Each facility is different.

For Vigor Shipyards, stormwater from the heavy industrial area of the shipyard is collected and discharged to King County's sanitary sewer system (Permit No. 7782-01) through the City of Seattle's utility lines. Vigor's contractual agreement with the City of Seattle contains a condition that the City reserve the right to reject the discharge in case the City encounters an emergency (e.g. reaching its hydraulic capacity in the line during an unusually heavy storm event). This has not yet occurred since the agreement was signed between 2002 and 2003. Due to the City's condition, Todd Pacific Shipyards, prior to Vigor's acquisition of the shipyard, had invested over 10 million dollars to reroute stormwater drainage lines and install a stormwater collection system to accommodate a 10 year 24-hour storm event. During that time, Todd Pacific Shipyards also requested an authorization to be included in the permit to allow the discharge of stormwater to the receiving water, to provide for the contingency that the City of Seattle might fail to grant permission to continue to discharge at a time when the facility has reached its storage capacity (which would result in flooding in the active area of the shipyard). In order to accommodate Todd Pacific Shipyard's request and to allow the stormwater improvement project to move forward, Ecology placed water quality-based limits for stormwater discharge in the permit. This is a direct discharge to the receiving water body. As of today, Vigor has not discharged stormwater from the active area of the shipyard to the receiving water. With no existing discharge, Ecology set limits based simply on water quality standards until an actual discharge allows evaluating discharge characteristics.

Seattle Iron and Metals has a mixing zone authorized based on treatment meeting AKART requirements. Ecology has determined that a performance-based limit for lead was significantly more stringent than the water quality-based limit. The Ecology permit writer agreed with public comments on the draft permit to set a performance based-limit for lead. In contrast to Seattle Iron and Metals, Shell has not applied for a mixing zone. Shell discharges to the City's storm sewer where the discharge commingles with other discharges in the vicinity including stormwater from the vicinity's drainage area before draining into the Duwamish River. Should Shell demonstrate that AKART requirements have been met, and still cannot meet the water quality-based limits, Shell is qualified to apply for establishment of a mixing zone. In a case in which there are numerous individual discharges discharging to the same pipe, it is difficult to estimate mixing zone and dilution values for discharge from the storm sewer. Given this reason, Ecology has determined that the copper and lead benchmark values are appropriate for Shell's stormwater discharge. In addition to the monitoring requirements listed under S2 of the permit, Shell is required to conduct **whole effluent toxicity testing** once per permit cycle. Therefore, Ecology believes the proposed permit contains adequate conditions to regulate Shell's discharge.

Table 2 : Shell's metals data collected from 2010 to 2015

Date	Copper, µg/L	Lead, µg/L	Zinc, µg/L
3/1/2010	4	7.5	17
4/1/2010	4.8	8.8	23
5/1/2010	5.3	11	25
6/1/2010	6.9	12	34
10/1/2010	5.2	7.2	23

Date	Copper, µg/L	Lead, µg/L	Zinc, µg/L
11/1/2010	4.4	11	29
12/1/2010	16	49	110
1/1/2011	5.7	10	61
2/1/2011	10	29	99
3/1/2011	4.1	12	48
4/1/2011	5	11	66
5/1/2011	8.9	25	140
6/1/2011	9.5	14	140
7/1/2011	20	7.4	91
9/1/2011	22	8.4	69
10/1/2011	14	8.6	71
11/1/2011	8.8	10	77
12/1/2011	6.3	9	30
1/1/2012	4.4	9.9	20
2/1/2012	7.1	7.5	36
3/1/2012	6.6	6.5	28
4/1/2012	6.6	3.5	40
5/1/2012	15	190	150
6/1/2012	10	10	98
7/1/2012	9.2	1.8	14
8/1/2012	8.8	5.7	41
10/1/2012	15	23	31
11/1/2012	6	43	31
12/1/2012	18	200	190
1/1/2013	20	58	83
2/1/2013	4.8	6.7	27
3/1/2013	6.3	10	26
4/1/2013	7.5	6.4	29
5/1/2013	6	5.9	35
6/1/2013	11	5.5	68
8/1/2013	9.3	6.6	50
9/1/2013	8.4	8.1	63
10/1/2013	4.3	4.6	26
11/1/2013	4	3.8	23
12/1/2013	2.8	6.3	21
1/1/2014	4.1	7.3	34
2/1/2014	2.7	7.2	79
3/1/2014	9.4	5.1	30
4/1/2014	6.6	3.8	21
5/1/2014	6	6.9	19
6/1/2014	6.6	5.1	35
7/1/2014	6.1	7.2	30
8/1/2014	9.6	12	38
9/1/2014	7	11	34
10/1/2014	4.4	4.5	16
11/1/2014	3.2	3.7	17

Date	Copper, µg/L	Lead, µg/L	Zinc, µg/L
12/1/2014	2.8	4.4	20
1/1/2015	3.1	3.7	30
2/1/2015	3	4	35
3/1/2015	1.9	2.3	20
Max	22	200	190
Avg	7.79	17.49	49.84

Soundkeeper's Comment D: "Ecology must ensure outfall 002 discharges do not cause or contribute to violations of water quality standards for heavy metals. Why doesn't the draft permit impose numeric effluent limits for copper, lead, and zinc on outfall 002? Outfall 002 drains the facility's roadway and parking area for trucks, areas and activities known to be sources of these metals. This drainage is treated with an oil water separator, but, unlike outfall 002, there is no targeted treatment for metals. Oil water separators are almost completely ineffective at removing copper, lead, and zinc. These factors indicate that outfall 002 discharges may contain high levels of the most toxic form (dissolved) of copper, lead, and zinc. Has Ecology considered these factors?

Moreover, the statement in the fact sheet that "copper, lead, and zinc data submitted during the last permit cycle appear to exceed water quality standards periodically" and that effluent limits are required for these parameters does not appear to be limited to discharges from outfall 001. Does Ecology believe outfall 002 does not have a reasonable potential to cause or contribute to violations of water quality standards for copper, lead, or zinc? If so, what information is that belief based on? If not, Ecology must impose numeric effluent limitations on outfall 002 discharges of these pollutants."

Ecology's Response: Ecology will add monitoring and benchmark values in response to this comment. This area has limited industrial activity, only truck traffic. Since the discharge associated with outfall 002 is stormwater discharge and it discharges into the City's storm sewer, Ecology will add benchmark values for copper, zinc, and turbidity for outfall 002 in the permit. These benchmark values will be the same as those in the ISGP. Since heavy metals and turbidity have not been monitored for this outfall before, a compliance schedule will also be added to the permit to allow adequate data to be collected to evaluate whether additional treatment, or structural BMPs would need to be employed to meet the bench mark values.

Ecology hopes the above responses have addressed your concerns. Should you want to discuss the above responses, please don't hesitate to contact Jeanne Tran by email: jtra461@ecy.wa.gov or by phone at (425) 649-7078.

Sincerely,

Jeanne Tran, P.E.
Water Quality Program

Central Files: WQ1.3